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⑤④ **Pressure bag assembly for air-massage.**

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## Description

This invention relates to a pressure bag assembly for air-massage in which a plurality of air inflatable bags each having air-feeding and exhausting ports are arranged and a compressed air is fed to and exhausted from each bag for producing varied movements to have an efficient massage effect on an outer body surface.

Heretofore, various types of massaging devices have been proposed in one of which an air inflatable bag made of a flexible material such as rubber is wound around a body part such as an arm or a leg and the bag is inflated and deflated with a compressed air to apply and release pressure on a blood vessel, thereby to facilitate a circulation of blood (mainly venous blood and lymph) for massage.

The conventional device for air-massage, however, has the disadvantage that the air bag is inflated into a cylindrical form when filled with the air, so that an arched surface of the bag comes into uneven contact with the body part. As a result, pressure is localized with a minimum stimulus to give an uncomfortable feeling to the body part. In other words, overall even contact of the inflated bag with the body part is difficult to obtain so that a satisfactory massage effect may not be achieved.

Further, when a muscle of the diseased part becomes tense and stiff causing extremely bad flow of blood and lymph, a simple press and release of the diseased part may afford instantaneous comfort but not sufficient massage effect.

Another type of device for medical treatment employing various elastic elements is also known in order to obtain the desired physical effects similar to those of finger-pressure therapy and the acupuncture. The devices of this type, however, has been designed to treat a local site of a human body and may not be employed for general use. Even if such a device is employed for massage, it is too difficult to obtain a good massage effect making the stream of blood and lymph better.

United States Patent No. 1,608,239 discloses a garment for assisting blood circulation or massaging the human body comprising collapsible transverse or circumferential tubes to which air under pressure may be admitted to inflate the tubes one after another in groups so as to cause the garment to exert waves of pressure on the body. Substantially inelastic tubes are considered advantageous. The air may be directed to the various tubes in turn by means of a suitable rotary valve mechanism. The effect of the garment may be enhanced by clothing the patient in a union suit studded on the inside with padded buttons, before applying the garment over the union suit.

German Published Patent Application No. 2,814,691 discloses a flexible air pad for alleviating deep venous thrombosis that can be wound about a limb. The pad includes a plurality of parallel pressure compartments which can be

sequentially inflated. The compartments are covered on one side with padding material such as foam rubber or non-woven cloth.

The present invention is concerned with a pressure bag assembly for air massage comprising a plurality of distinct air inflatable bags arranged in parallel alignment with each other, each having its own port for feeding and exhausting air and at least one elastic element attached to one surface of at least a portion of a number of inflatable bags, said air inflatable bags being connected to a change-over valve mechanism provided with feeding and exhausting means for independently inflating and deflating said air bags relative to each other in a time difference so as to move said elastic element in a wavy manner. According to the invention said elastic element comprises an air inflatable elastic bag provided with at least one air-filled projection on the surface adapted to contact the body part and with an air port for adjusting the air volume so as to control the elasticity of said elastic element.

The inventor has developed an efficient and economical air massage device which utilizes an elastic element having a conventional medical effect, thereby to allow the reduction in the quantity of air fed into the air inflatable bag so that a small type of air-feeding and exhausting unit with a compressor of lesser capacity may be employed.

Namely, it has been found out that a comfortable massage effect may be achieved by the pressure bag assembly of the invention which combines an elastic contacting element for a direct massage action to a body part with an air inflatable bag for inflation and deflation with compressed air, and is wound around a body part such as a diseased site for feeding and exhausting air in relation to the bag. Thus, the elastic element comes into even contact with the body portion and makes the massage effect uniform and comfortable.

Further, it has been found that the equipment associated with the device may be made smaller because a higher massage effect may be obtained with a lesser capacity of bag using a lesser volume of air.

The elastic element of the device is constructed as another air bag which is filled with an adjustable volume of air. The elastic element may be made of an elastic plate provided with a plurality of air-filled projections on the surface in contact with the body part for enhancement of the massage effect.

An alternative is to provide the elastic element with a plurality of independent air-filled projections on the surface.

As the result of further diligent study for developing an air massage device having a change-over mechanism which eliminates all the disadvantages of the conventional air-massage devices described hereinbefore and readily produces a variety of massage effects in spite of its simple construction, the inventor has now improved a device for air-massage containing a rotatable

change-over valve mechanism capable of ensuring communication of any one of the air-feeding and exhausting ports with an air-feeding means. The improvement resides in that the change-over valve mechanism is provided with a set of distributing plates having two or three air-feeding and exhausting ports or channels circumferentially spaced apart equiangularly, for example at about 120°, the distributing plates are fitted concentrically with rotators each having bored passages which allow the air-feeding and exhausting ports of the distributing plates to communicate selectively with the air-feeding means or air-exhausting means, and the rotators are driven simultaneously to rotate by a motor. Thus, air is fed to one of air-inflatable bags through one of rotators while air is exhausted from other one of inflatable bags through another rotator, producing a variety of massage treatments and effects.

Accordingly, a general object of the invention is to provide a device for air-massage having a change-over valve mechanism, which achieves smooth operation and a variety of air-feeding and exhausting operations for a bag assembly combining a plurality of air inflatable bags, in spite of its simple construction.

Preferred embodiments of the invention are described in detail below by way of example only with reference to drawings which illustrate different aspect of the invention, in which:—

Figure 1 is a systematic diagram showing the basic construction of an air-massage pressure bag assembly according to the invention,

Figure 2 is a perspective view of one embodiment of the air inflatable bag used in the invention,

Figure 3 is a cross sectional view of the bag taken along the line III—III of Figure 2,

Figure 4 is a perspective view of another embodiment of the bag,

Figure 5 is a cross sectional view of the bag taken along the line V—V of Figure 4,

Figure 6 is a perspective view of another embodiment of the bags used in the pressure bag assembly according to the invention,

Figure 7 is a pictorial view of the device of Figure 6 in actual use,

Figure 8 is a perspective view of the modified bag assembly of Figure 6,

Figures 9(a) and (b) show one embodiment of the distributing plate of the change-over valve mechanism used in the air-massage device according to the invention, wherein Figure 9(a) is a plan view and Figure 9(b) is a sectional view taken along the line XII—XII of Figure 9(a),

Figure 10(a), (b) and (c) show rotors adapted to the distributing plate shown in Figure 9, wherein Figure 10(a) is a plan view, Figure 10(b) is a sectional view taken along the line XIII—XIII of Figure 10(a) and Figure 10(c) is a bottom view,

Figure 11 is a plan view showing operational condition of the change-over valve mechanism shown in Figure 9 and 10,

Figure 12(a) to (f) are schematic views showing

operational conditions of the bags operated through the change-over valve mechanism shown in Figure 11, and

Figure 13 is a pictorial view of pressure bag assemblies of the invention in actual use.

Figure 1 is a systematic view showing an overall construction of the air-massage device according to the invention, in which the reference numerals 10a and 10b represent bag assemblies combining a plurality of air-inflatable bags with further elastic elements (not shown). Each air-inflatable bag 12 of the bag assemblies 10a and 10b is connected to pipes 16a and 16b derived in branch from a change-over valves mechanism 14a and 14b to which compressed air generated by a compressor 18 is supplied through pressure regulator means 20a and 20b. The regulated air pressure is detected by pressure gauges 21a and 21b.

Figures 2 and 3 show the general arrangement of the air inflatable bag 12 used in the device of the invention, in which the reference numeral 12 represents a flat air inflatable bag made of air impermeable material. The bag 12 is provided with an air port 22 for connection with an air tube 24.

One surface of the bag 12 is combined with an elastic element 26 which is constructed as another air bag. The surface of the element 26 in contact with the body is provided with projections 28 for better massage effect (Figures 4 and 5). Further, the air bag 26 used as the elastic element is provided with an air port 30 for adjustment of the air volume so as to control elasticity of the elastic bag element 26.

In accordance with this construction of the air inflatable pressure bag assembly the elastic element 26 in contact with the part of the body is independently arranged in relation to the bag 12 movable with the air pressure, so that uniform movement throughout the elastic element 26 is obtained, effecting even massage action on the part of the body in contact with the bag. Moreover, in accordance with the invention the role of the bag 12 is only to put air-pressure indirectly on to the elastic element 26 for movement of the latter, so that the total volume inside the bag 12 may be very much reduced and the volume of the air used becomes very small. As a result, a compact type of air-compressor may be employed for air feeding.

Figure 6 shows the device according to the invention, in which a plurality of the air inflatable bags 12 are combined with the single elastic element 26. Thus, in this embodiment the bags 12 are provided with their own ports 22 for the air-tubes 24 which are connected to the air source through a change-over valve mechanism 14 (see Figure 1), so that a time difference may be established between the adjacent bags and a wavy movement of the elastic element 26 may be obtained, resulting in a high massage effect. In one utilization of this embodiment, as shown in Figure 7, a plurality of the bags 12a, 12b, 12c ... are arranged in parallel in the shape of a mat, on

the whole upper surface of which is partially or wholly spread the elastic element 26 and the body may be laid on the latter in order to enjoy a comfortable massage effect throughout the whole body. Moreover, as shown in Figure 8, the elastic element 26 may be combined with a receiving bag 34 having a plurality of receptive areas 32 for holding the bags 12 so that connecting and disconnecting the bags 12 may be performed conveniently and the device may be conveniently handled. Figures 6 to 8 do not show any details of the elastic element 26.

The air inflatable bag assembly may be wound and fixed around a diseased part with the elastic element 26 in contact therewith, and air is fed to and exhausted from the bags 12, as described hereinafter, thereby achieving an even massage effect over the whole diseased part around which the elastic element 26 is wound.

Besides the general usage of winding the bag assembly around the body part, it may be constructed in the shape of the mattress for the protection of bedsores or shaped into an article surrounding given body part, giving a variety of massage effects.

Alternatively, in the embodiments of Figures 2 to 5, a heating or cooling fluid material such as hot or cold water may be introduced into the elastic element 26 in the form of air bag for alleviating a load of body surface and scattering pressure points as well as producing a warming or cooling action, thereby enhancing the massage effect. Instead of introduction of the hot or cold water, a heating or cooling element especially in a gel state may be filled into the inside of the air inflatable elastic bag element 26 for a similar effect.

The change-over valve mechanism 14a, 14b used in the device of the invention will be described hereinbelow.

As shown in Figures 9 and 10, the change-over valve mechanism 14a, 14b comprises a distributing plate 44 for air-feeding and exhausting and two rotators 46 and 46' fitted to the distributing plate 44. Through the distributing plate 44 are bored two sets of three air-feeding and exhausting ports 42a, 42b, 42c and 42'a, 42'b, 42'c circumferentially spaced apart equiangularly at 120° as well as passages 43 and 43' communicating with air-feeding pipes 16a and 16b.

Through the rotators 46 and 46', on the other hand, are bored passages 48 and 48' communicating with an air-feeding system as well as passages 50 and 50' communicating with an air-exhausting system.

The rotators 46 and 46' are, as shown in Figure 10, provided at their peripheries with gears 45, 45' and one of the rotators 46 is connected at its axis to a driving shaft of a motor M (not shown). Thus, the pair of rotators 46 and 46' may be rotated simultaneously at the same speed through meshing of the gears 45 and 45'.

The operation of each air-inflatable bag 12 of the bag assemblies 10a, 10b using the change-

over valve mechanism 14 will be described hereinbelow.

As shown in Figure 11, when the change-over valve mechanism as shown in Figures 9 and 10 is employed the pair of rotators 46, 46' are rotated in the direction shown by arrows, so that the air-feeding and exhausting ports 42a to 42c and 42a' to 42c' communicating through the pipes 16a, 16b with each air chamber of bag assemblies 10a and 10b may be sequentially connected with the air-feeding passages 48, 48' and air-exhausting passages 50, 50' in the rotators 46, 46'. Thus, the air-feeding and exhausting operation may be achieved, as shown in Figures 12a to 12f (in which the elastic elements 26, air pipes and other details have been omitted).

If the change-over valve mechanisms thus constructed are connected in parallel to the same air-supplying source for operating two sets of the air-inflatable bags, one of which is operated for air-feeding while the other is operated for air-exhausting, then the alternate and sequential operations may be smoothly achieved. In the operation of the invention in this manner, pressure regulators 20a and 20b may be arranged for adjusting the supplied air pressure. Thus, massage on the body using different massaging pressures or the use of two sets of the air-inflatable bags of different volumes may be possible so that the single device may serve as two air-massage devices.

Furthermore, a plurality of the pressure bag assemblies may be wound around arms and/or legs for simultaneous air-feeding and exhausting, thereby affording a variety of good massage treatments and their effects. In this embodiment, the rotators of the change-over valve mechanisms may be rotated in any direction and/or at any speed so that any desired massage treatment may be readily achieved. (Figure 13).

Furthermore, in accordance with the invention the elastic element 26 may be releasably combined with the air inflatable bags 12 or bag assembly 10, thereby a number of combinations are possible between the various embodiments of the elastic elements 26 and the air inflatable bags 12, giving a wide variety of massage effects.

Besides the foregoing embodiments, the change-over valve mechanism may comprise a plurality of solenoid valves provided for a plurality of air-feeding means communicating with a common compressed air source and the air-feeding means may communicate with a plurality of air-feeding and exhausting ports of the air inflatable bags for controlling the operation through the solenoid valves.

The pressure bag assembly according to the invention has a simple construction and can be manufactured at a low cost, and the size and cost of the attached equipment may be reduced, so that the device can be readily and conveniently employed not only for use by an expert but also for general home use.

## Claims

1. A pressure bag assembly for air massage comprising a plurality of distinct air inflatable bags (12) arranged in parallel alignment with each other, each having its own port (22) for feeding and exhausting air and at least one elastic element (26) attached to one surface of at least a portion of a number of inflatable bags (12), said air inflatable bags (12) being connected to a change-over valve mechanism (14) provided with a feeding and exhausting means (42, 43, 44, 45, 46, 48, 50) for independently inflating and deflating said air bags (12) relative to each other in a time difference so as to move said elastic element (26) in a wavy manner, characterised in that said elastic element (26) comprises an air inflatable elastic bag provided with at least one air-filled projection (28) on the surface adapted to contact the body part and with an air port (30) for adjusting the air volume so as to control the elasticity of said elastic element (26).

2. A pressure bag assembly according to claim 1 wherein said elastic element (26) is releasably connected to said air bags (12).

3. A pressure bag assembly according to claim 1 or claim 2, wherein the elastic element (26) is provided with a receiving bag (34) for storing the plurality of air inflatable bags (12).

4. A pressure bag assembly according to any one of the preceding claims, wherein the elastic element (26) is provided with a heating or cooling element.

5. A pressure bag assembly according to any one of the preceding claims, wherein the air inflatable bags (12) are formed in the shape of a mat, over the whole upper surface of which is mounted the elastic element (26).

6. A pressure bag assembly according to any one of claims 1 to 4, wherein the air inflatable bags (12) are formed of flexible material and are adapted to be shaped for surrounding body parts over the whole inner surface of which is mounted the elastic element (26).

7. A pressure bag assembly according to any one of the preceding claims, wherein said change-over valve mechanism (14) comprises a distributing plate (44) provided circumferentially and equiangularly with a plurality of air-feeding and exhausting ports (42), rotators (46) contacted concentrically with the distributing plate (44) and provided with passages (48, 50) communicating with the air-feeding and exhausting means, and a means for driving the rotators (46), said plurality of air-feeding ports (42) of the distributing plate (44) being connected through respective tubes (24) to a plurality of air-feeding and exhausting ports (22) of the air inflatable bags (12).

8. A pressure bag assembly according to any one of claims 1 to 6, wherein said change-over valve mechanism (14) comprises a plurality of a solenoid valves provided for a plurality of air-feeding means communicating with a common compressed air source, each of said air-feeding means communicating with respective air-feed-

ing and exhausting ports (22) of said plurality of air-inflatable bags (12).

9. A pressure bag assembly according to claim 7, wherein said change-over valve mechanism (14) comprises a set of valve mechanisms in which each distributing plate (44) is provided equiangularly spaced apart at approximately 120° with three air-feeding and exhausting ports (42a, 42b, 42c) and each rotator (46) is provided with a first passage (48) communicating with the air-feeding means corresponding to either one of the air-feeding and exhausting ports (22) provided for the distributing plate (44) and said second passage (50) communicating with the air-exhausting means corresponding to all the remaining air-feeding and exhausting ports (22).

10. A pressure bag assembly according to claim 7 or claim 9, wherein a plurality of rotators (46) each having a gear (45) at its periphery are arranged for synchronous rotation though meshing of gears, said rotators (46) being driven with an alternating or direct current motor.

11. A pressure bag assembly according to claim 7, 9 or 10, wherein said air-feeding means comprises an air compressor (18) and an air pressure regulator (20).

## Revendications

1. Dispositif à coussins pneumatiques permettant de réaliser un massage par air et comportant une pluralité de coussins pneumatiques gonflables séparés (12) alignés parallèlement les uns aux autres et dont chacun comporte son propre orifice (22) permettant l'introduction et l'évacuation de l'air, et dans lequel au moins un élément élastique (26) est fixé à une surface d'au moins une partie d'un certain nombre de coussins gonflables (12), et dans lequel lesdits coussins pneumatiques gonflables (12) sont raccordés à un mécanisme de valves de commutation (14) comportant des moyens d'introduction et d'évacuation (42, 43, 44, 45, 46, 48, 50) permettant de gonfler et de vider, le façon indépendante, lesdits coussins pneumatiques (12) les uns par rapport aux autres à des intervalles de temps permettant de déplacer ledit élément élastique (26) selon un mode d'ondulations, caractérisé en ce que ledit élément élastique (26) comporte un coussin pneumatique élastique gonflable comportant au moins une partie saillante (28) remplie d'air sur sa surface apte à contacter la partie du corps et comportant un orifice d'aération (30) permettant de régler le volume de l'air de manière à commander l'élasticité dudit élément élastique (26).

2. Dispositif à coussins pneumatiques selon la revendication 1, dans lequel ledit élément élastique (26) est relié de façon détachable auxdits coussins pneumatiques (12).

3. Dispositif à coussins pneumatiques selon la revendication 1 ou 2, dans lequel ledit élément élastique (26) est équipé d'un sac de logement (34) servant à loger l'ensemble des coussins pneumatiques gonflables (12).

4. Dispositif à coussins pneumatiques selon

l'une quelconque des revendications précédentes, dans lequel l'élément élastique (26) comporte un organe de chauffage ou de refroidissement.

5. Dispositif à coussins pneumatiques selon l'une quelconque des revendications précédentes, dans lequel les coussins pneumatiques gonflables (12) sont réalisés sous la forme d'un matelas, sur l'ensemble de la surface supérieure duquel se trouvent monté l'élément élastique (26).

6. Dispositif à coussins pneumatiques, selon l'une quelconque des revendications 1 à 4, dans lequel les coussins pneumatiques gonflables (12) sont réalisés en un matériau souple et sont aptes à être conformés de manière à entourer les parties du corps, sur l'ensemble de sa surface intérieure, sur laquelle est monté l'élément élastique (26).

7. Dispositif à coussins pneumatiques, selon l'une quelconque des revendications précédentes, dans lequel ledit mécanisme à valves de commutation (14) comporte une plaque de distribution (44) comportant, d'une manière répartie selon des angles égaux sur son pourtour, une pluralité d'orifices (42) d'introduction et d'évacuation de l'air, des dispositifs rotateurs (46) contactés de façon concentrique par la plaque de distribution (44) et comportant des passages (48, 50) communiquant avec les moyens d'introduction et d'évacuation de l'air et un dispositif servant à entraîner les dispositifs rotateurs (46), ladite pluralité d'orifices d'introduction d'air (42) de la plaque de distribution (44) étant raccordée par l'intermédiaire de tubes respectifs (24) à une pluralité d'orifices (22) d'introduction et d'évacuation de l'air des coussins pneumatiques gonflables (12).

8. Dispositif à coussins pneumatiques selon l'une quelconque des revendications 1 à 6, dans lequel ledit mécanisme à valves de commutation (14) comporte une pluralité de valves électromagnétiques munies d'une pluralité de moyens d'introduction de l'air communiquant avec une source d'air comprimé commune, chacun desdits moyens d'introduction de l'air communiquant avec des orifices respectifs (22) d'introduction et d'évacuation de l'air de ladite pluralité de coussins pneumatiques gonflables (12).

9. Dispositif à coussins pneumatiques, selon la revendication 7, dans lequel ledit mécanisme à valves de commutation (14) comporte un ensemble de mécanismes à valves, dans lesquels chaque plaque de distribution (44) comporte trois orifices (42a, 42b, 42c) d'introduction et d'évacuation de l'air, qui sont répartis en étant équidistants angulairement d'un angle d'environ 120°, et dans lequel chaque dispositif rotateur (46) comporte un premier passage (48) communiquant avec lesdits moyens d'introduction de l'air correspondant à l'un desdits orifices (22) d'introduction et d'évacuation de l'air prévus pour la plaque de distribution (44), et ledit second passage (50) communiquant avec lesdits moyens d'évacuation de l'air correspondant avec l'ensemble des autres ori-

fices (22) d'introduction et d'évacuation de l'air.

10. Dispositif à coussins pneumatiques, selon la revendication 7 ou 9, dans lequel une pluralité de dispositifs rotateurs (46), comportant chacun une denture (45) sur son pourtour, sont disposés de manière à tourner en synchronisme par suite de l'engrènement de pignons, lesdits dispositifs rotateurs (46) étant entraînés par un moteur à courant alternatif ou à courant continu.

11. Dispositif à coussins pneumatiques selon la revendication 7, 9 ou 10, dans lequel les moyens d'introduction de l'air comprennent un compresseur (18) et un régulateur (20) de la pression de l'air.

#### Patentansprüche

1. Für pneumatische Massage bestimmte Druckbehälteranordnung, bestehend aus einer Vielzahl gesonderter, mit Luft aufblasbarer Behälter (12), die zueinander in paralleler Ausrichtung angeordnet sind und jeweils ihre eigene Öffnung (22) zur Luftzuführung und -entnahme aufweisen und aus wenigstens einem elastischen Element (26), das an eine Oberfläche wenigstens einer Teilanzahl aufblasbarer Behälter (12) angebracht ist, wobei die mit Luft aufblasbaren Behälter (12) mit einem mit einer Zufuhr- und Entnahmeeinrichtung (42, 43, 44, 45, 46, 48, 50) versehenen Wechselventilmechanismus (14) verbunden sind, um dieselben voneinander unabhängig mit einer Zeitdifferenz aufzublasen und zu entleeren, so daß das elastische Element (26) wellenartig bewegt wird, dadurch gekennzeichnet, daß das elastische Element (26) einen mit Luft aufblasbaren elastischen Behälter umfaßt, der auf der Oberfläche mit wenigstens einem luftgefüllten, zur Berührung des Körperteils vorgesehenen Vorsprung (28) und mit einer Luftöffnung (30) zur Einstellung des Luftvolumens für die Steuerung der Elastizität des elastischen Element (26) versehen ist.

2. Druckbehälteranordnung nach Anspruch 1, bei der das elastische Element (26) mit den Luftbehältern (12) lösbar verbunden ist.

3. Druckbehälteranordnung nach Anspruch 1 oder 2, bei der das elastische Element (26) mit einem Aufnahmebehälter (34) zur Unterbringung einer Vielzahl mit Luft aufblasbarer Behälter (12) versehen ist.

4. Druckbehälteranordnung nach einem der vorhergehenden Ansprüche, bei der das elastische Element mit einem Wärme- oder Kühlelement versehen ist.

5. Druckbehälteranordnung nach einem der vorhergehenden Ansprüche, bei der die mit Luft aufblasbaren Behälter (12) in der Form einer Matte ausgebildet sind, über deren gesamte Oberfläche das elastische Element (26) angebracht ist.

6. Druckbehälteranordnung nach einem der Ansprüche 1 bis 4, bei der die mit Luft aufblasbaren Behälter (12) aus flexiblem Material gebildet sind und eine zum Einfassen von Körperteilen entsprechende Form aufweisen, über deren gesamte

innere Oberfläche das elastische Element (26) angebracht ist.

7. Druckbehälteranordnung nach einem der vorhergehenden Ansprüche, bei der der Wechselventilmechanismus (14) eine Verteilerplatte (44), die kreisförmig und gleichwinklig mit einer Vielzahl luftzuführender und -entnehmender Öffnungen (42) versehen ist, konzentrisch mit der Verteilerplatte (44) in Kontakt stehende Rotoren (46), die mit der Luftzuführ- und Entnahmeeinrichtung verbundenen Durchlässen (48, 50) versehen sind, und eine Antriebseinrichtung für die Rotoren (46) umfaßt, wobei eine Vielzahl luftzuführender Öffnungen (42) der Verteilerplatte (44) über entsprechende röhrenähnliche Leitungen (24) mit einer Vielzahl luftzuführender und -entnehmender Öffnungen (22) der mit Luft aufblasbaren Behälter (12) verbunden ist.

8. Druckbehälteranordnung nach einem der Ansprüche 1 bis 6, bei der der Wechselventilmechanismus (14) eine Vielzahl Magnetventile aufweist, die für eine Vielzahl luftzuführender, mit einem gemeinsamen Druckluftanschluß in Verbindung stehender Einrichtungen vorgesehen sind, wobei jede der luftzuführenden Einrichtungen mit entsprechenden luftzuführenden und -entnehmenden Öffnungen (22) der Vielzahl mit Luft aufblasbarer Behälter (12) in Verbindung steht.

9. Druckbehälteranordnung nach Anspruch 7, bei der der Wechselventilmechanismus (14) eine Menge Ventilmechanismen aufweist, bei denen jede Verteilerplatte mit drei luftzuführenden und -entnehmenden Öffnungen (42a, 42b, 42c), die räumlich getrennt und gleichwinklig bei etwa 120° angeordnet sind, versehen ist, und jeder Rotor (46) mit einem ersten Durchlaß (48), der mit einem der luftzuführenden und -entnehmenden Öffnungen (22), vorgesehen für die Verteilerplatte (44), entsprechenden Luftzufuhreinrichtung kommuniziert, und dem zweiten Durchlaß (50), der mit der allen übrigen luftzuführenden und -entnehmenden Öffnungen (22) entsprechenden Luftentnahmeeinrichtung kommuniziert, versehen ist.

10. Druckbehälteranordnung nach Anspruch 7 oder 9, bei der eine Vielzahl Rotoren (46), die jeweils an ihrem Rand eine Verzahnung (45) aufweisen, zur synchronen Drehung aufgrund ineinandergreifens von Zähnen angeordnet und mit einem Wechselstrom- oder Gleichstrommotor angetrieben sind.

11. Druckbehälteranordnung nach Anspruch 7, 9 oder 10, bei der die Luftzufuhreinrichtung einen Luftkompressor (18) und einen Luftdruckregler (20) umfaßt.

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FIG.1

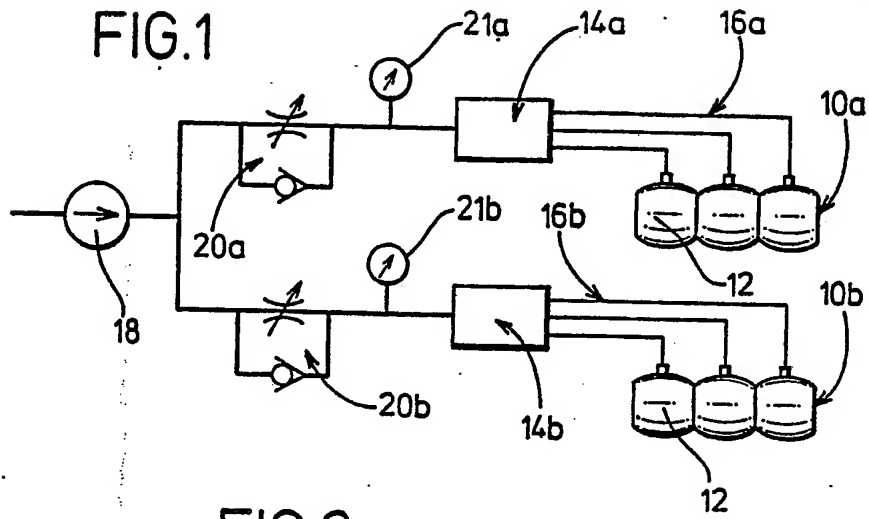


FIG.2

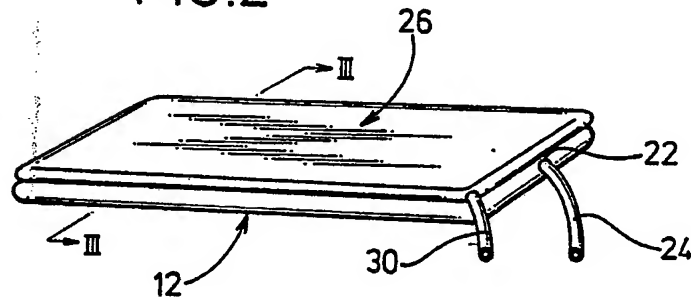


FIG.3

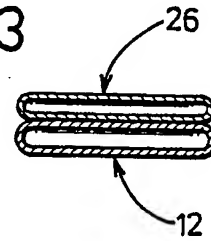


FIG.4

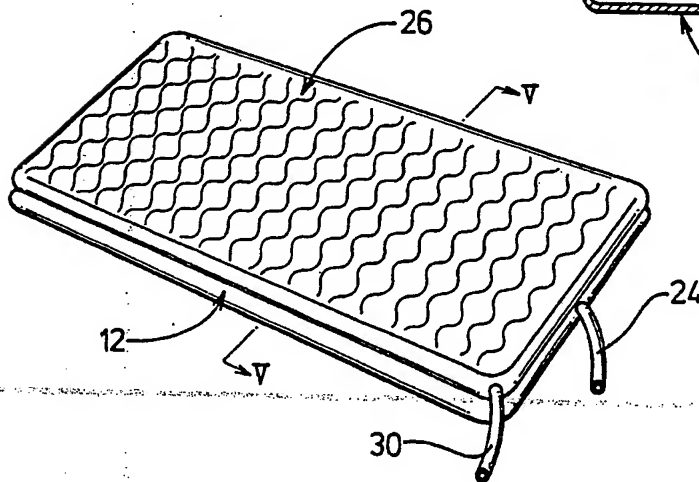




FIG. 5

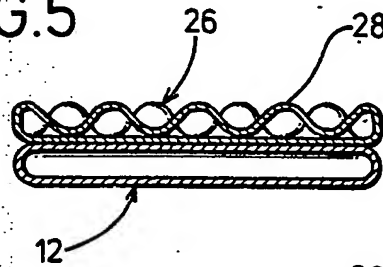


FIG. 6

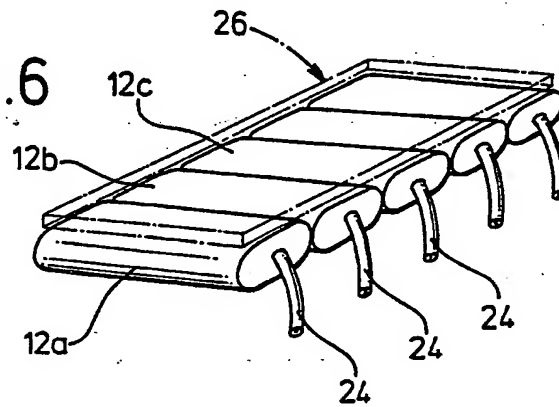


FIG. 7

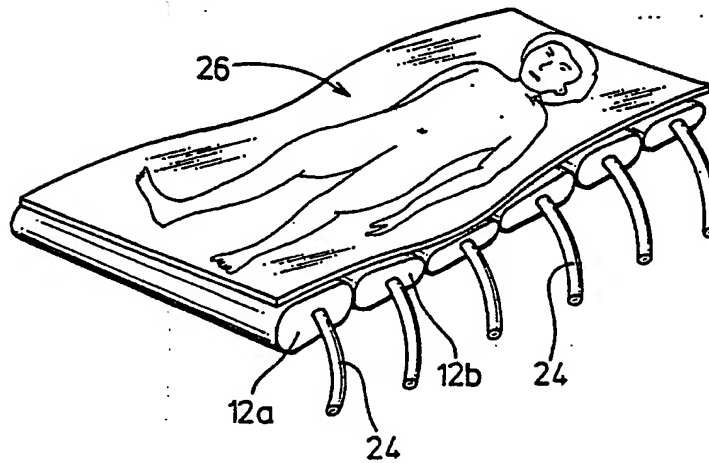


FIG. 8

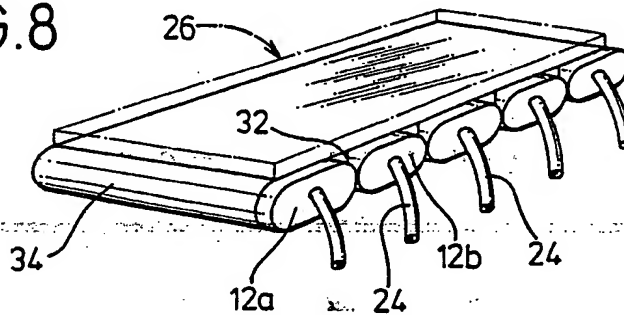


FIG.9

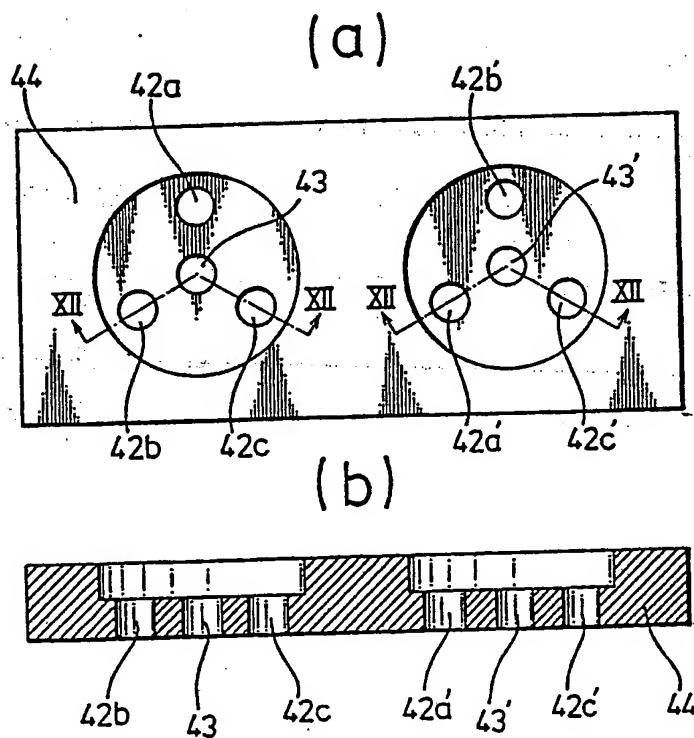


FIG.10

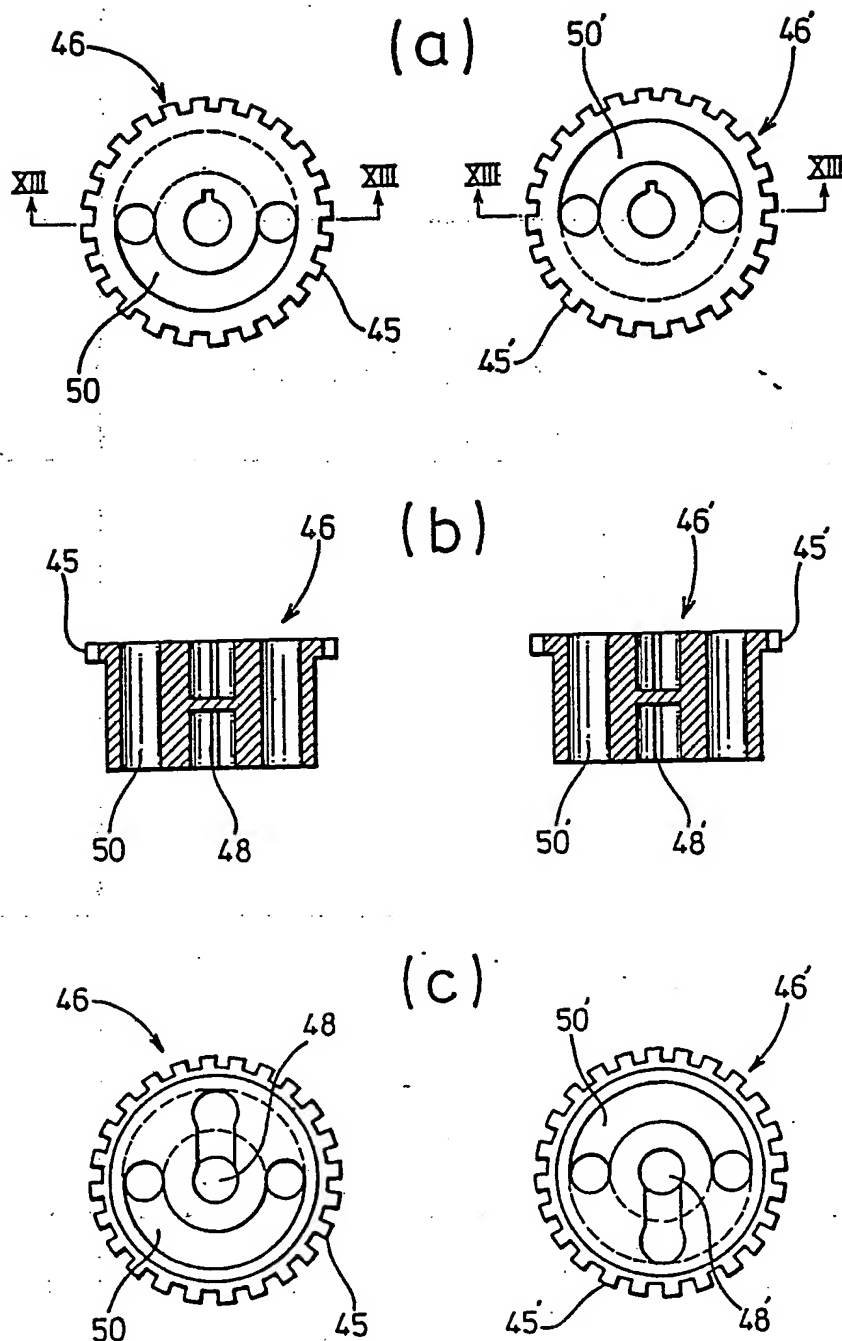


FIG.11

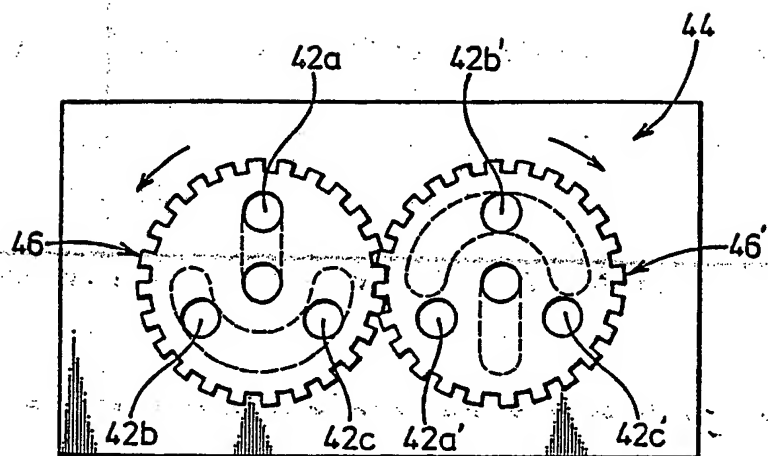


FIG.12

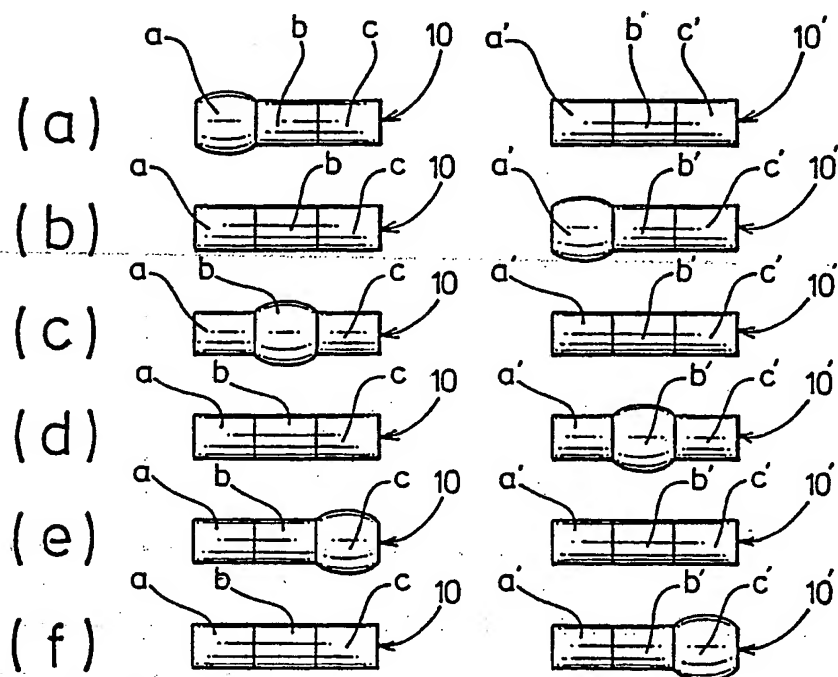
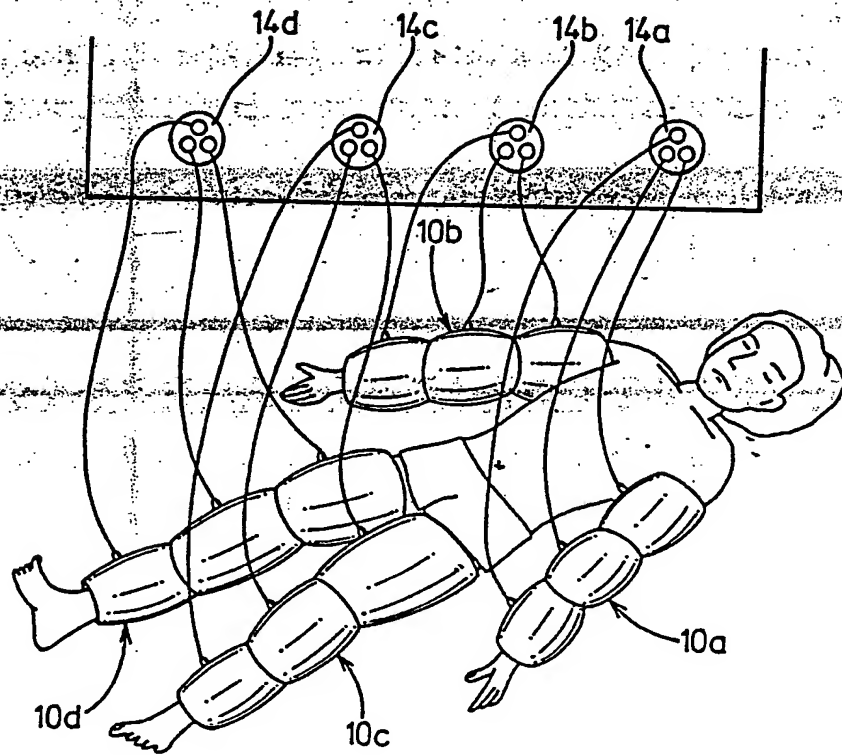


FIG. 13



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